

WHAT IS CLAIMED IS:

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- 5 1. An image processing device, comprising a
memory unit having a memory region for storing images
of at least one screens, a memory control unit for
performing an input system operation to write image
data to the memory unit by using a first clock and a
first image synchronizing signal and for performing an
output system operation to output image data read out
from the memory unit by using a second clock and a
10 second image synchronizing signal, a clock generating
unit for generating said second clock, and a
synchronizing control unit for inputting said second
clock and for outputting said second image
synchronizing signal,
- 15 wherein said synchronizing control unit generates
a third image synchronizing signal asynchronous to said
first image synchronizing signal by dividing said
second clock and a fourth image synchronizing signal
with being synchronized to said first image
20 synchronizing signal by using said second clock and
selects one of said third image synchronizing signal
and said fourth image synchronizing signal to output it
as said second image synchronizing signal.
- 25 2. An image processing device according to claim
1, wherein said synchronizing control unit selects one
of said third image synchronizing signal and said

fourth image synchronizing signal according to a vertical frequency of said first image synchronizing signal and outputs it as said second image synchronizing signal.

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3. An image processing device according to claim 1, wherein said synchronizing control unit selects one of said third image synchronizing signal and said fourth image synchronizing signal according to a purpose for a use of the output image and outputs it as said second image synchronizing signal.

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4. An image processing device, comprising a memory unit having a memory region for storing images of at least one screens, a memory control unit for performing an input system operation to write image data to the memory unit on by using a plurality of first clocks and a plurality of first image synchronizing signals synchronized to a plurality of input signals inputted to said plurality of input system signal processing units and for performing an output system operation to output image data read out from the memory unit by using a second clock and a second image synchronizing signal, a clock generating unit for generating said second clock, and a synchronizing control unit for inputting said second clock and for outputting said second image

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synchronizing signal,

wherein said synchronizing control unit generates a third image synchronizing signal asynchronous to said first image synchronizing signals by dividing said second clock and fourth image synchronizing signals with being synchronized to said first image synchronizing signals by using said second clock and selects one of said third image synchronizing signal and said fourth image synchronizing signals to output it as said second image synchronizing signal.

5. An image processing device according to claim 4, wherein said synchronizing control unit selects one of said third image synchronizing signal and said fourth image synchronizing signals according to a vertical frequency of said first image synchronizing signals and outputs it as said second image synchronizing signal.

6. An image processing device according to claim 4, wherein said synchronizing control unit selects one of said third image synchronizing signal and said fourth image synchronizing signals according to a purpose for a use of the output image and outputs it as said second image synchronizing signal.

7. An image processing device according to claim

4, wherein said synchronizing control unit selects one of said third image synchronizing signal and said fourth image synchronizing signals according to presence or absence of a dynamic image or a proportion thereof in the plurality of input signals inputted to said plurality of input system signal processing units and outputs it as said second image synchronizing signal.

10 8. An image processing device according to claim 4, wherein said synchronizing control unit selects one of said third image synchronizing signal and said fourth image synchronizing signals according to uses or types of said plurality of input system signals and
15 outputs it as said second image synchronizing signal.

Sub a17 9. An image processing device according to one of claims 4 to 8, further comprising means for outputting a request of setting or re-setting input
20 image signals to signal sources for inputting signals to said plurality of input system signal processing units and for outputting a request of a synchronization to the second image synchronizing signal to an arbitrary input signal source which is asynchronous to
25 said second image synchronizing signal selected to be output out of said third image synchronizing signal and said fourth image synchronizing signals.

10. An image processing device, comprising at least one signal input units to which video signals of a plurality of systems are inputted, a memory unit having a memory region for storing images of at least one screens, image processing means having at least one image display signal output units and synthesizing the video signals of said plurality of systems on said memory unit to output it to said signal output units, and control means for controlling said image processing means,

wherein said control means select a preferential video signal according to image characteristic information of the video signals of said plurality of systems and change the operation of said image processing means to one appropriate for the video signal of the preferential system.

11. An image processing device, comprising at least one signal input units to which video signals of a plurality of systems are inputted, a memory unit having a memory region for storing images of at least one screens, at least one image display signal output units, image processing means for synthesizing the video signals of said plurality of systems on said memory unit to output it to said signal output units, and control means for controlling said image processing means,

wherein said control means select a preferential video signal according to image characteristic information of the video signals of said plurality of systems and characteristic information of the image display unit connected to said signal output unit and change the operation of said image processing means to one appropriate for the video signal of the preferential system and for the image display unit connected to said signal output unit.

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12. An image processing device, comprising at least one signal input units to which video signals of a plurality of systems are inputted, a memory unit having a memory region for storing images of at least one screens, at least one image display signal output units, image processing means for synthesizing the video signals of said plurality of systems on said memory unit to output it to said signal output units, and control means for controlling said image processing means,

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wherein said control means, having communication means for outputting a request of changing image characteristics to at least one input video signals of said plurality of systems, select a preferential video signal according to image characteristic information of the video signals of said plurality of systems, change the operation of said image processing means to one

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appropriate for the video signal of the preferential system, and output a request of changing image characteristics to those appropriate for the operation of said image processing means to video signals of at least one systems other than the video signal of the preferential system.

13. An image processing device, comprising at least one signal input units to which video signals of a plurality of systems are inputted, a memory unit having a memory region for storing images of at least one screens, at least one image display signal output units, image processing means for synthesizing the video signals of said plurality of systems on said memory unit to output it to said signal output units, and control means for controlling said image processing means,

wherein said control means, having communication means for outputting a request of changing image characteristics to at least one input video signals of said plurality of systems, select a preferential video signal according to image characteristic information of the video signals of said plurality of systems and characteristic information of the image display units connected to said signal output units, change the operation of said image processing means to one appropriate for the video signal of the preferential

system and the image display units connected to said
signal output units, and output a request of changing
image characteristics to those appropriate for the
operation of said image processing means to video
5 signals of at least one systems other than the video
signal of the preferential system.

14. An image processing device, comprising at
least one signal input units to which video signals of
10 a plurality of systems are inputted, a memory unit
having a memory region for storing images of at least
one screens, at least one image display signal output
units, image processing means for synthesizing the
video signals of said plurality of systems on said
15 memory unit to output it to said signal output units,
and control means for controlling said image processing
means,

wherein said control means select a preferential
video signal according to arrangement conditions for a
20 screen on which the video signals of said plurality of
systems are output to said signal output units and
change the operation of said image processing means to
one appropriate for the video signal of the
preferential system.

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15. An image processing device, comprising at
least one signal input units to which video signals of

a plurality of systems are inputted, a memory unit having a memory region for storing images of at least one screens, at least one image display signal output units, image processing means for synthesizing the video signals of said plurality of systems on said memory unit to output it to said signal output units, and control means for controlling said image processing means,

wherein said control means select a preferential video signal according to image characteristic information of the video signals of said plurality of systems and arrangement conditions for a screen on which the video signals of said plurality of systems are output to said signal output units and change the operation of said image processing means to one appropriate for the video signal of the preferential system.

16. An image processing device, comprising at least one signal input units to which video signals of a plurality of systems are inputted, a memory unit having a memory region for storing images of at least one screens, at least one image display signal output units, image processing means for synthesizing the video signals of said plurality of systems on said memory unit to output it to said signal output units, and control means for controlling said image processing

means,

wherein said control means select a preferential video signal according to image characteristic information of the video signals of said plurality of systems, arrangement conditions for a screen on which the video signals of said plurality of systems are output to said signal output units, and characteristic information of the image display units connected to said signal output units and change the operation of said image processing means connected to said signal output units to one appropriate for the video signal of the preferential system and the image display units connected to said signal output units.

17. An image processing device, comprising at least one signal input units to which video signals of a plurality of systems are inputted, a memory unit having a memory region for storing images of at least one screens, at least one image display signal output units, image processing means for synthesizing the video signals of said plurality of systems on said memory unit to output it to said signal output units, and control means for controlling said image processing means,

wherein said control means, having communication means for outputting a request of changing image characteristics to at least one input video signals of

5 said plurality of systems, select a preferential video
signal according to image characteristic information of
the video signals of said plurality of systems and
arrangement conditions for a screen on which the video
signals of said plurality of systems are output to said
10 signal output units, change the operation of said image
processing means to one appropriate for the video
signal of the preferential system, and output a request
of changing the image characteristics to those
15 appropriate for the operation of said image processing
means to video signals of at least one systems other
than the video signal of the preferential system.

18. An image processing device, comprising at
15 least one signal input units to which video signals of
a plurality of systems are inputted, a memory unit
having a memory region for storing images of at least
one screens, at least one image display signal output
units, image processing means for synthesizing the
20 video signals of said plurality of systems on said
memory unit to output it to said signal output units,
and control means for controlling said image processing
means,

25 wherein said control means, having communication
means for outputting a request of changing image
characteristics to at least one input video signals of
said plurality of systems, select a preferential video

signal according to image characteristic information of
the video signals of said plurality of systems,
arrangement conditions for a screen on which the video
signals of said plurality of systems are output to said
5 signal output units, and characteristic information of
image display units connected to said signal output
units, change the operation of said image processing
means to one appropriate for the video signal of the
preferential system and the image display units
10 connected to said signal output units, and output a
request of changing the image characteristics to those
appropriate for the operation of said image processing
means to video signals of at least one systems other
than the video signal of the preferential system.

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Sub a 2 / 19. An image processing device according to one
of claims 10 to 18, wherein said control means comprise
storing means for storing contents of the operation of
said image processing means for which said preferential
20 input video signal is selected and changed.

Sub a 2 / 20. An image processing device according to one
of claims 10 to 18, wherein the optimized operation of
said image processing means is for an update cycle time
25 of display screens of the display units in said control
means.

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21. An image processing device according to one of claims 10 to 13 and claims 15 to 18, wherein said image characteristics information referred to for selecting the preferential input video signal is update
5 cycle time information of the input image and the optimized operation of said image processing means is for an update cycle time of display screens of the display units in said control means.

10 22. An image processing device according to one of claims 10 to 13 and claims 15 to 18, wherein said image characteristics information referred to for selecting the preferential input video signal is
15 dynamic image or still image judgment information of the input image and the optimized operation of said image processing means is for an update cycle time of display screens of the display units in said control means.

20 Sub a27 23. An image processing device according to one of claims 10 to 13 and claims 15 to 18, wherein said image characteristics information referred to for selecting the preferential input video signal is use or
25 type information of the input image and the optimized operation of said image processing means is for an update cycle time of display screens of the display units in said control means.

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24. An image processing device according to one of claims 10 to 13 and claims 15 to 18, wherein said image characteristics information referred to for selecting the preferential input video signal is resolution information of the input image and the optimized operation of said image processing means is for a resolution of display screens of the display units in said control means.

25. An image processing device according to one of claims 10 to 13 and claims 15 to 18, wherein said image characteristics information referred to for selecting the preferential input video signal is gamma characteristic information of the input image and the optimized operation of said image processing means is a gamma correction on display elements of the display units in said control means.

26. An image processing device according to one of claims 10 to 13 and claims 15 to 18, wherein said image characteristics information referred to for selecting the preferential input video signal is color information of the input image and the optimized operation of said image processing means is a color correction for the display units in said control means.

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27. An image processing device according to one

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of claims 10 to 13 and claims 15 to 18, wherein said image characteristics information referred to for selecting the preferential input video signal is brightness and contrast information of the input image and the optimized operation of said image processing means is brightness and contrast corrections for the display elements of the display units in said control means.

28. An image processing device, comprising input system image processing units for adjusting image qualities of a plurality of input systems, a memory unit having a memory region for storing images of at least one screens, a memory control unit for performing a write or readout operation of image data to or from the memory unit and for synthesizing images of a plurality of input systems to a single screen to output the signal, an output system image processing unit for adjusting image quality of said synthesized signal and for outputting it as an image display output, and an image quality control unit for controlling said input system image processing units and said output system image processing unit and for outputting the image display signal,

wherein said image quality control means, having correction characteristics for images of said plurality of input systems and a correction characteristic for a

display characteristic of the image display unit
connected to the image quality control unit, select one
of the correction characteristics for the images of
said plurality of input systems and convert it to a
5 correction characteristic synthesized with the
correction characteristic for the display
characteristic of said image display unit for batch-
processing in said output system image processing unit.

10 29. An image processing device according to
claim 28, wherein said image quality control unit
selects one of the correction characteristics for the
images of said plurality of input systems by using
image quality information sampled in said plurality of
15 input system image processing units and converts it to
a correction characteristic synthesized with the
correction characteristic for the display
characteristic of said image display unit for batch-
processing in said output system image processing unit.

20 30. An image processing device according to
claim 28, wherein said image quality control unit
selects one of the correction characteristics for the
images of said plurality of input systems according to
25 a purpose for a use of the output image and converts it
to a correction characteristic synthesized with the
correction characteristic for the display

characteristic of said image display unit for batch-processing in said output system image processing unit.

31. An image processing device according to
5 claim 28, wherein said image quality control unit
selects one of the correction characteristics for the
images of said plurality of input systems according to
uses or types of said plurality of the input system
signals and converts it to a correction characteristic
10 synthesized with the correction characteristic for the
display characteristic of said image display unit for
batch-processing in said output system image processing
unit.

15 ^{sub a 3} 32. An image processing device according to one
of claims 28 to 31, further comprising means for
outputting a request of setting or re-setting input
image signals to signal sources for inputting signals
to said plurality of input system signal processing
20 units and means for outputting a request of changing
characteristics of the input image appropriate for said
synthesized correction characteristic to an arbitrary
input signal source which has not been selected for the
synthesization with the correction characteristic for
25 the display characteristic of said image display unit
out of the correction characteristics for the images of
said plurality of input systems.

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33. An image processing device according to one of claims 1 to 32, wherein the image processing device is used as a signal processing unit of an image display device.

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34. An image processing device according to one of claims 1 to 32, wherein the image processing device is used as a signal processing unit for an image display unit of a computer.

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35. An image processing device according to one of claims 1 to 32, wherein the image processing device is used as a signal processing unit for an image display unit of a digital TV.

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36. An image processing device according to one of claims 33 to 35, wherein said image display device has a liquid crystal display unit.

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37. An image processing device according to one of claims 33 to 35, wherein said image display device has a display unit of a plasma display or an electric-charge emission type device.

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38. An image processing device according to one of claims 33 to 35, wherein said image display device has a display unit of a reflection type device which

39. A computer program is recorded in the memory of the image processing system. The program performs the operations of the image processing system for the processing of claims 1 to 3.

39. A computer readable medium on which a program is recorded for a computer to execute the operations of the image processing device according to claims 1 to 38.

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